

July 13, 2004

TO: G. Burke

FROM: A. Andujo

SUBJECT: Space Technology 5 Post-Launch Support Study

REFERENCE: ST-5 Preliminary Study dated June 9, 2004

This study is in response to a request from the ST-5 mission. The purpose of this study is to evaluate the DSN's ability to schedule support for the three spacecraft ST-5 mission. During the June 10, 2005 teleconference it was discussed and requested that the study be completed using a nominal requirement of one 15 minute pass per day per spacecraft. (See figures 1 and 2)

Methodology

Reference information was acquired using the FASTER (Forecasting and Scheduling Tool for Earth-based Resources) forecasting system and the updated mission set database from the February 2004 Resource Allocation Review Board (RARB). The information used for analysis was received from Bob Shendock in the form of the events and the user loading profile submitted May 26, 2004 and viewperiods submitted via Steve Waldherr June 1, 2004.

The viewperiods used for this study were those delivered in the comma separated value file (STK output). The viewperiods used were assumed to apply to all 3 spacecraft. This study has not analyzed any limitations these spacecraft tracks have on the DSN antennas (e.g., slew rate, antenna keyhole). By analysis the Madrid and Goldstone complexes were not studied because viewperiod duration was generally less than 15 minutes in length and as a result support was placed at DSS-34 as it is the only Canberra antenna with an X-band uplink capable of supporting the spacecraft. It is notable that viewperiods preclude support of the ST5 mission from the 3 antennas at Goldstone or the 2 antennas at Madrid. The period studied were the post launch period of March 13 – June 11, 2006.

Summary of Results

The analysis was performed using 1 pass per spacecraft per day, the results of which shows an average supportable time of 76% (See figure 3 below). Essentially the antenna is forecasted to support approximately 2 of 3 passes per day for the period studied.

Recommendations

As in our preliminary recommendation we recommend that the ST-5 mission use the DSN to supplement launch support, critical events and perform backup support. Please note that the results seen in this analysis are based on mission information provided to date and any subsequent changes to the mission would require our team to re-analyze the information.

9-Jun-04

User Loading Profiles

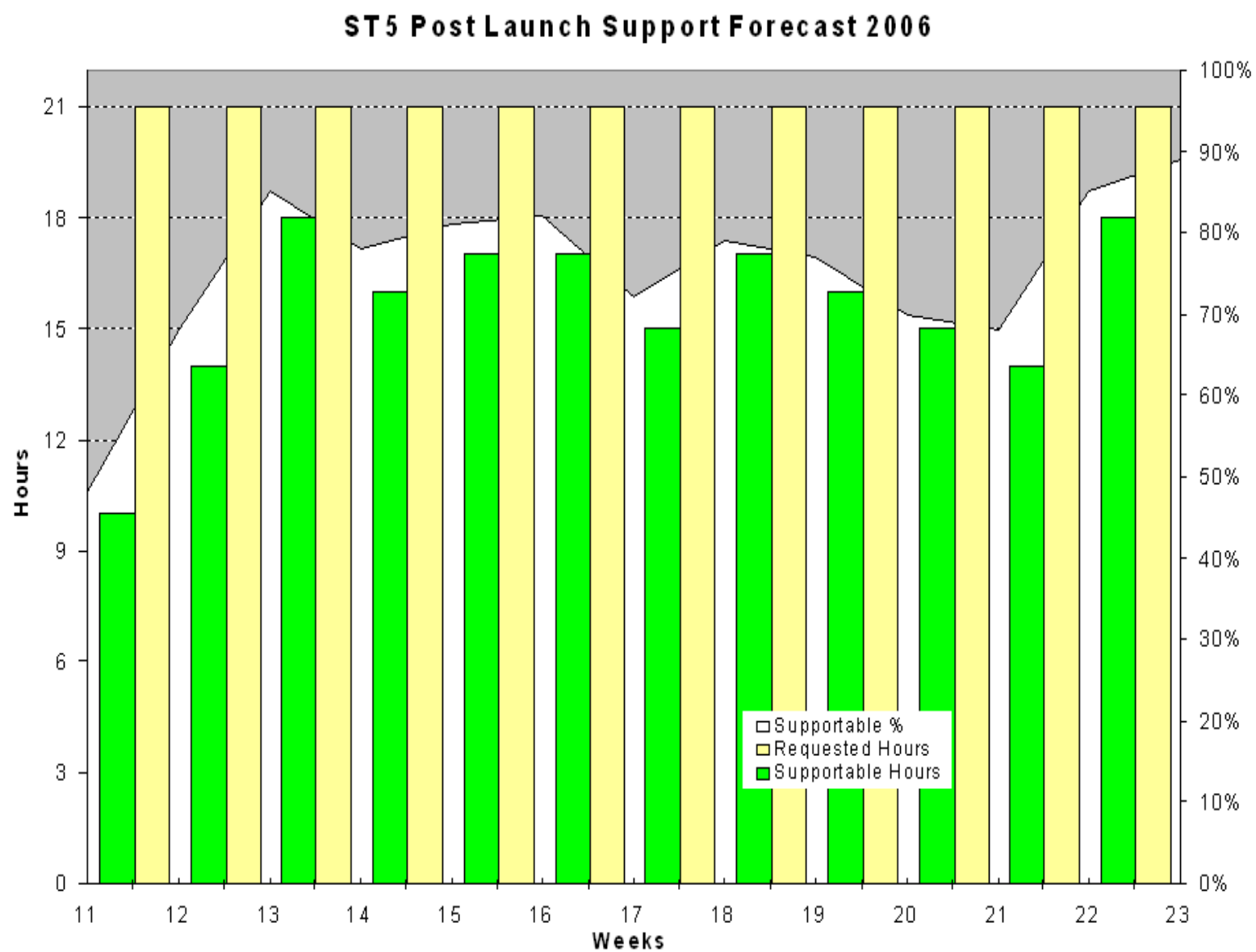
Concurrence: _____
Project Manager _____ Date _____

Space Technology 5

Figure 2: ST-5 User loading Profile Utilized in this study

2

Figure 3: ST5 Post Launch Support Forecast 2006



As always, the results of this study are subject to change, in that network loading changes as requirements for planned missions are input and updated and periods of antenna downtime are identified. We will continue to work with ST-5 and other users of the DSN to maximize the time available for each individual user.

cc:

C. Abramo
R. Bartoo
D. Morris
S. Guduru
E. Hampton
N. Lacey